The Ulster Medical Journal, Volume 59, No. 1, pp. 93 – 95, April 1990.

Case report

Carotid sinus massage in carotid sinus syndrome

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Accepted 29 November 1989.

The cardioinhibitory carotid sinus syndrome is diagnosed when syncopal patients have prolonged asystole during carotid sinus massage. The heart rate slowing and drop in blood pressure in response to carotid sinus massage is commonly reproducible within one minute of pressure over the carotid sinus. The present case disputes the reproducibility of the response in all cases, emphasising the necessity for repeated massage in suspected cases of carotid sinus syndrome and unexplained syncope.

CASE REPORT

A 71-year-old man was admitted to the cardiac unit having had a syncopal episode whilst eating lunch. During the meal he felt nauseated, dizzy and faint and then lost consciousness. After rapid spontaneous recovery he complained of further nausea and vomited until hospital admission. There were no epileptiform movements during the syncope. For the previous year he had had almost daily presyncopal episodes associated with prolonged standing, head turning or looking upwards, but in many episodes no precipitating features were identified. Ischaemic heart disease with infrequent exertional angina had been diagnosed 15 years previously but he was not on prophylactic anti-anginal medication. A diagnosis of alcoholic cirrhosis had been made nine years previously, and he had remained off alcohol since then, with normal liver function tests at subsequent outpatient review.

On examination in the cardiac unit 60 minutes after the syncope he was fit, alert and well orientated. The heart rate was 84 per minute in sinus rhythm. Blood pressure was 150/80 mmHg, with no orthostatic drop. General physical and cardiovascular examination was unremarkable. Serial surface electrocardiographs and cardiac enzyme sampling showed no evidence of myocardial infarction. Echocardiogram and 48-hour cardiac telemetry were also normal. Right and left sided carotid sinus massage on the second and third days after admission produced periods of asystole of 5·2 seconds (right) and 3·2 seconds (left) on day two and 4·4 seconds (right) and 3·0 seconds (left) on day three (Figure). Carotid sinus massage was performed using the technique of Morley et al[1]: Longitudinal massage over the carotid sinus was continued for six seconds, whilst simultaneously palpating the ipsilateral temporal artery; this was sufficient to

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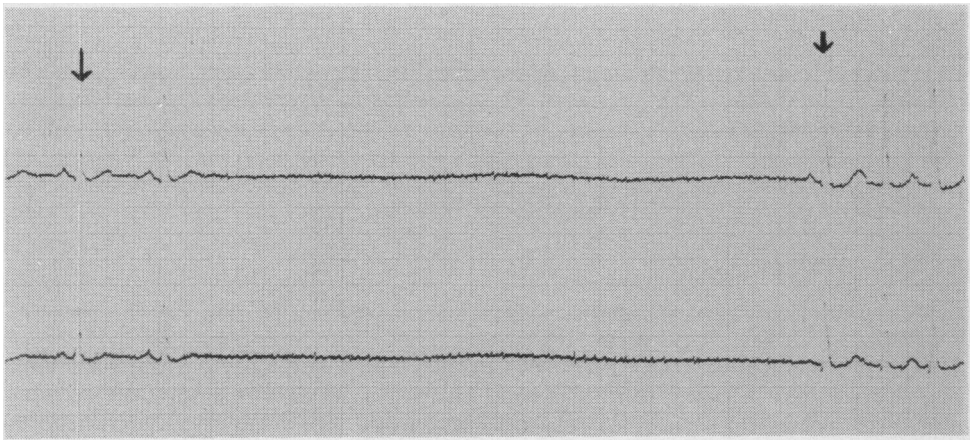

Figure. Carotid sinus massage for six seconds (arrows) producing 5·4 seconds asystole on day seven of hospital admission.

produce slowing of heart rate. A minimum delay of one minute was kept between right and left sided massage. On day four carotid sinus massage was repeated by two observers and on day five by four observers, in the morning and again in the afternoon. On each of these occasions the heart rate slowed from a maximum of 65 per minute to a minimum of 45 per minute, but on no occasion was significant heart rate slowing present. During massage blood pressure was simultaneously monitored to outrule a predominant vasodepressor effect, but systolic pressure remained above 130 mmHg and did not fall more than 20 mmHg on days four and five. Head-up tilt to 70 degrees for 45 minutes failed to reproduce syncope. On the seventh day in hospital carotid massage by the same two observers reproduced asystolic periods of 6·0 and 5·4 seconds (right) and 3·0 and 3·2 seconds (left). The carotid sinus syndrome was diagnosed, and because of the history of syncope and frequent presyncopal episodes a dual chamber pacemaker (Intermedics Avis, DVI Mode) was implanted. The patient remains asymptomatic at one year follow-up with no recurrence of dizziness or syncope.

COMMENT

The cause of syncope may remain undiagnosed in up to fifty per cent of patients despite clinical and electrophysiological investigation (Kenny RA, MD Thesis). More recently, head-up tilt has been used to reproduce vasovagal symptoms in front of a medical witness; this technique identified vasovagal syndrome as a cause of recurrent unexplained syncope in seventy per cent of patients.[2,3] Despite advances in the investigation of syncope a persistent number of patients remain undiagnosed. The present patient had had frequent presyncopal symptoms and a single syncopal episode. After admission carotid sinus massage produced asystole, indicating that the cause of his syncope was the cardioinhibitory carotid sinus syndrome. This response to carotid sinus massage was not consistently reproduced during subsequent follow-up, which may account for the failure to establish this diagnosis in a proportion of unexplained syncope patients.

The carotid sinus syndrome has three clinical presentations: cardioinhibition (asystolic episodes), vasodepression (hypotensive episodes), and a mixed pattern with a predominant cardioinhibitory component, which is commonest. The

diagnosis is established in syncopal patients in whom six seconds of longitudinal unilateral massage over the carotid sinus results in a minimum of three seconds asystole (cardioinhibition) or 50 mmHg drop in systolic blood pressure (vasodepression).[1] Dual chamber cardiac pacing results in symptomatic relief in ninety per cent of patients.[4]

The response to pacing in the present instance was complete with no symptom recurrence at one year follow-up; previously symptoms had occurred daily. The syncopal episode which precipitated admission and some of the presyncopal episodes were vagal in character, and head turning and neck extension, procedures which mimic carotid sinus massage, also precipitated symptoms. Considerable overlap exists between the vasovagal syndrome and the carotid sinus syndrome: seventy per cent of subjects with the carotid sinus syndrome become vasovagal after head-up tilt. Carotid sinus massage does not produce cardioinhibitory or vasodepressor responses in patients with severe vasovagal syncope.[5] This degree of variation in heart rate has not been previously documented.

A negative response to carotid sinus massage does not exclude the presence of the carotid sinus syndrome. The response may not be reproducible and repeated examination is necessary to confirm or exclude the diagnosis in unexplained cardiac syncope.

REFERENCES

1. Morley CA, Sutton R. Editorial review — carotid sinus syncope. *Int J Cardiol* 1984; **6**: 287-93.
2. Kenny RA, Ingram A, Bayliss J, Sutton R. Head-up tilt: a useful test for investigating unexplained syncope. *Lancet* 1986; **1**: 1352-4.
3. Fitzpatrick A, Sutton R. Tilting towards a diagnosis in recurrent unexplained syncope. *Lancet* 1989; **1**: 658-60.
4. Morley CA, Perrins EJ, Grant P, Chan SL, McBrien DJ, Sutton R. Carotid sinus syncope treated by pacing. Analysis of persistent symptoms and role of atrioventricular sequential pacing. *Br Heart J* 1985; **47**: 411-8.
5. Kenny RA, Lyon C, Ingram AM, Bayliss J, Stafford L, Lightman SL, Sutton R. Enhanced vagal activity and normal arginine vasopressin response in carotid sinus syndrome: implications for a central abnormality in carotid sinus hypersensitivity. *Cardiovasc Res* 1987; **21**: 545-50.